Encoder Plug-In

USER MANUAL

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1 Introduction

Dolby E is used to transmit audio-for-video from a network center to affiliate stations, where it is decoded into analog or PCM, or re-encoded into Dolby Digital for rebroadcast to the consumer.

The Dolby E data takes the space of a stereo pair of digital audio, at 48 kHz. Dolby E contains up to 8 channels which can be divided in different ways to create up to 22 unique channel configurations, called Program configurations. Each Program configuration is made of one or more programs, or groups of channels. A program can be a single mono channel, a stereo channel, or multichannel surround sound up to 5.1 channels. A Program configuration can be combinations of Programs such a 5.1 plus stereo. See Appendix A for a complete list of Program configurations.

This plug-in is available as a file-based-only plug-in. The plug-in reads up to 8 tracks of audio from the host application, and encodes them into a single Dolby E file. The user interface allows for easy selection of all available encoding parameters, including AC3 metadata.

2 Main Screen

Figure 2-1 shows the SurCode for Dolby E Encoder plug-in.

Figure 2-1

2.1 Program Configuration

A Dolby E “Program” is a group of tracks that carry one item of audio content. The Program can have as few as one channel or as many as 6 channels (in a 5.1 surround format). Combinations of

Programs are grouped together to form “Program Configurations”. Each program configuration can have as few as one program, and as many as 8 programs.

You must tell the encoder what Program Configuration you want to use for encoding. The default on start-up is “5.1 + 2”.

The Program Configuration is selected from a pull-down menu in the upper-left corner of the plug-in (see Figure 2-2).

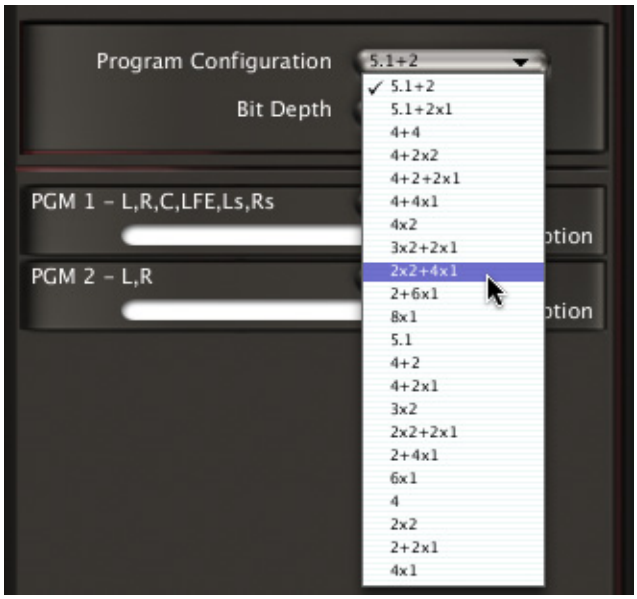

Figure 2-2

A check mark indicates the currently selected Program Configuration.

Below the Bit Depth selector is a listing of all programs in the selected Program Configuration (see Figure 2-3). Each Program lists the channels that are present in that Program. You can select the Dialog Level for each channel from a pull-down menu, and you can enter a Description of the Program. The Dialog Level and Program Description information is duplicated on the Program Tabs.

Figure 2-3

2.2 Bit Depth

Directly below the Program Configuration selector is the Bit Depth selector (see Figure 2-4).

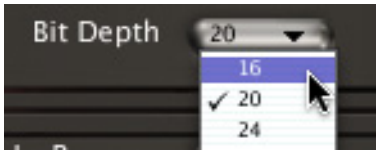

Figure 2-4

All Program Configurations can be encoded in 20- or 24-bits. 16-bit is not available for Program Configurations which have more than 6 channels.

2.3 Output File Name

You must select a file name and path for the new Dolby E encoded file. To name an output file, click on the Browse button under the File Name display (see Figure 2-5), browse to the location where you want to write the new encoded file, and type in a file name. The new file name will now appear above the Browse button.

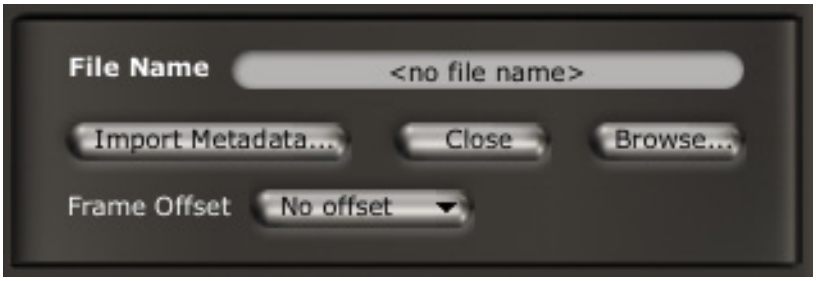

Figure 2-5

2.4 Import Metadata

A typical Dolby E encoded file will contain both Dolby E metadata (such as Program Configuration and Bit Depth) and AC3 metadata (such as Dialog Level and Preferred Downmix Mode). All of this metadata can be saved into the header of a .wav file (called the "dbmd chunk"), and retrieved for later use. The metadata can also be stored in a .xml file. The saving of metadata into a .wav or .xml file is done during decoding, so that the metadata associated with that audio will not be lost. SurCode for Dolby E *Decoder*, for example, can save the metadata in these ways.

SurCode for Dolby E Encoder makes it easy to grab metadata stored in a .wav or .xml file and use it in your current project. Just click on the Import Metadata button under the File Name. It will bring up a browse window from which you can choose a file with a ".wav" or ".xml" extension.

The imported metadata will immediately appear in SurCode, both on the Main tab and on the Program tabs.

2.5 Frame Offset

SurCode for Dolby E Encoder allows for a time shift of the audio relative to the video. This can be very useful with projects that involve encoding or decoding during tape transfers because these operations often contribute one frame of shift between the audio and video.

SurCode has a pull-down menu to select no offset, or one or two frames of offset, either advanced or delayed (see Figure 2-6). The plus (i.e. positive number) means the audio is being advanced relative to the video.

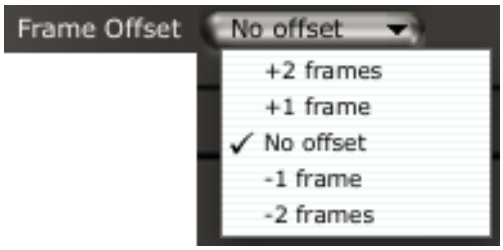

Figure 2-6

The frame offset is recorded into the BWF header of the .wav file in the Coding History "T" field, like this: "T=FrameOffset 2;"

2.6 Timecode

2.6.1 Start time

Start Time is a metadata value that gets saved into the encoded Dolby E file. It can be used during decoding to, for instance, position the audio relative to playback of a video file. The Start Time can be typed into the text box (see Figure 2-7).

Figure 2-7

2.6.2 Enable timecode

For some applications, users find it useful to write an invalid timecode into the original encoded file, to be replaced at a later time by valid timecode.

When the timecode-enable button is selected, the encoder writes valid timecode starting at the selected Start Time. When the button is not selected, the encoder writes invalid timecode (see Figure 2-8).

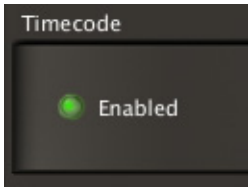

Figure 2-8

2.7 Frame Rate

Dolby E files can be encoded at frame rates of 23.98, 24, 25, 29.97, and 30 frames per second. The frame rate is selected from a pull-down menu (see Figure 2-9).The currently selected frame rate is indicated by a check mark.

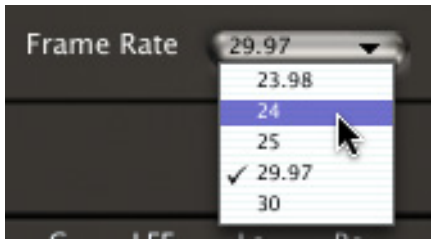

Figure 2-9

2.8 Input Routing

There are times when you may want to encode audio into the Dolby E file in a different order than they exist in your DAW tracks. The Input Routing selectors allow you to rearrange the ordering of the input channels.

There is one Input Routing selector for each channel in the encoded Dolby E file, for the Program Configuration that is chosen. Above each Input Routing selector is the name of the destination

channel in the Dolby E file (see Figure 2-10). The currently selected input channel is indicated by a check mark.

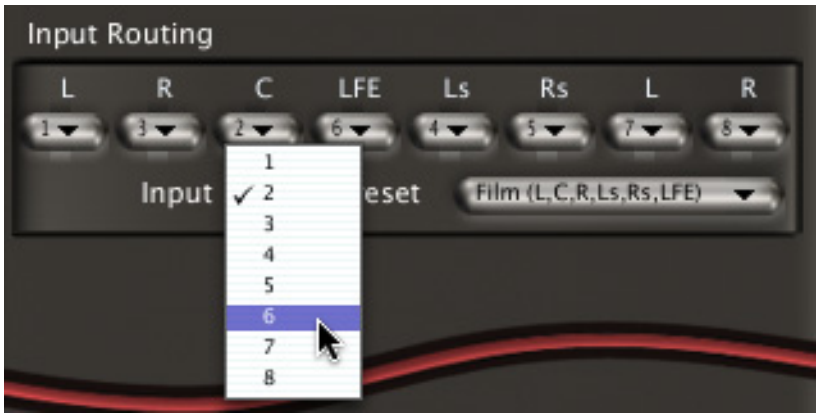

Figure 2-10

2.9 Input Routing Preset

There are three common standards for the channel ordering of a 5.1 surround sound file. To make it easy to interface to input channel ordering using different standards, the Input Routing Preset is provided to automatically set the Input Routing selectors (see Figure 2-11). The currently selected preset is indicated by a check mark. The Input Routing Preset is only available for Program Configurations that include a 5.1 Program.

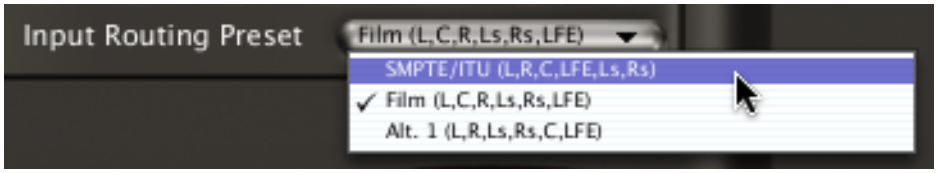

Figure 2-11

3 Metadata

At the bottom of the main screen are a series of tabs. These include one tab for each Program in the selected Program Configuration (see Figure 3-12). These are labeled “PGM 1”, “PGM 2”, etc. By clicking on a Program tab, you can view and change the AC-3 metadata for that Program.

Figure 3-12

4 Settings

The Settings tab contains the settings that do not involve metadata or routing (see Figure 4-13). The available settings on the Settings tab may vary, depending on which platform you are running the plug-in on.

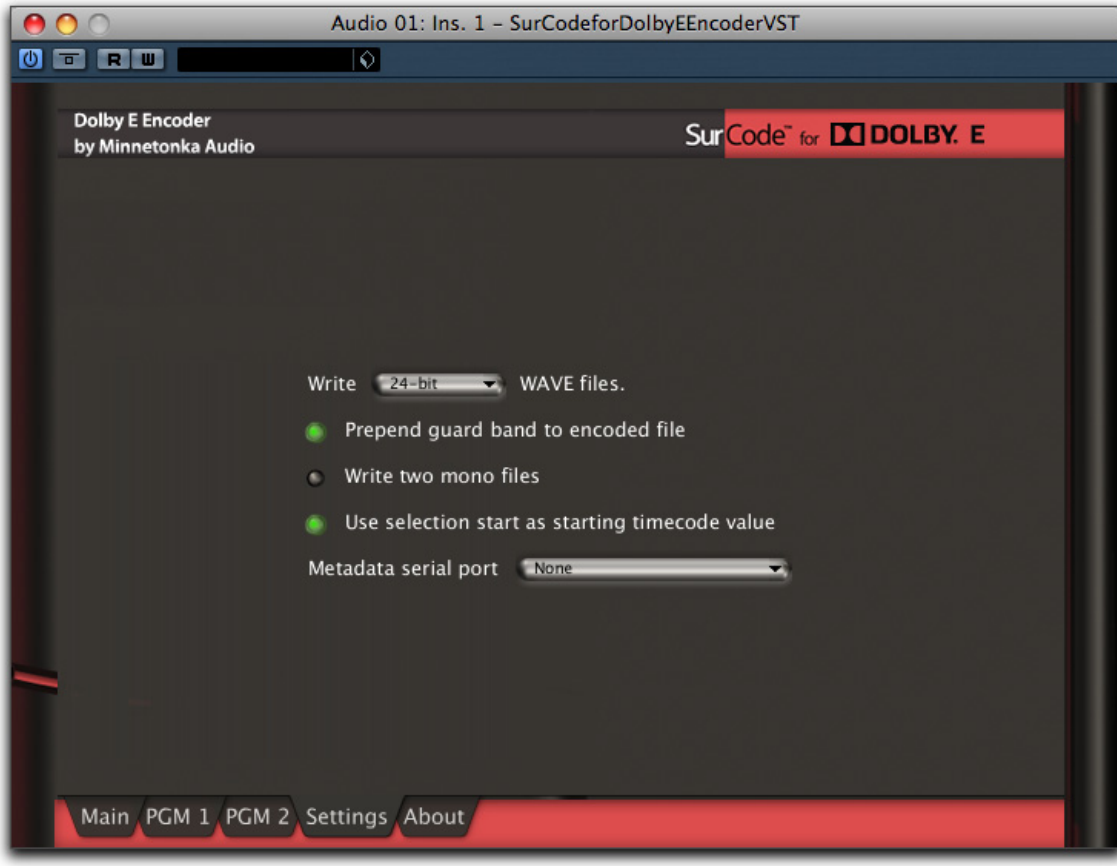

Figure 4-13

4.1 WAV file format

SurCode for Dolby E Encoder writes the encoded output files as SMPTE 337M .wav files. The files are normally 24-bit files. You can opt for the output files to be 32-bit.

4.2 Prepend guard band

The SMPTE 337M spec allows for a “guard band” which is a set of empty data points at the beginning of the file to delay the start of the first frame. Some systems require a guard band for proper operation.

4.3 Write two mono files

If this is selected, the output will be two mono files. If it is not selected, the output will be one two-channel interleaved file.

The mono file feature is primarily meant for Pro Tools users, since the Pro Tools region list uses mono files.

4.4 Use selection start as starting timecode value

If this is selected, SurCode will automatically read the starting time from the waveform selection of the workstation app, and insert it into the Starting Time of the encoder.

Note: In Nuendo, the selection start time is not copied to the Starting Time until the encoding process is started.

4.5 Metadata serial port

SurCode can read metadata through a serial port. This allows it to receive metadata from external sources such as the Dolby DP570.

The external metadata feature is active whenever a serial port is selected and encoding is not it progress. It cannot accept external metadata once encoding has started. It is inactive whenever the selection is “None”.

External metadata will alter the metadata settings in SurCode as they come in. If external metadata stops, SurCode will retain the last valid metadata that it received.

5 Using the Encoder in Pro Tools

SurCode for Dolby E Encoder reads the selected audio in the Pro Tools timeline for encoding into Dolby E files.

To begin, you will need to create a multichannel track within Pro Tools, or a collection of mono tracks. To create an 8-channel track, for instance, go to the Track menu and select New. A window will appear from which you can choose an 8-channel track by selecting “7.1” on the leftmost pull-down menu (see Figure 5-14). Then click on the Create button.

Figure 5-14

This will create an 8-channel track on the timeline (see Figure 5-15).

Figure 5-15

Now, drag your multichannel audio file to the Regions list (on the left), and then from the Regions list onto the track, and drag to the leftmost side (see Figure 5-16). Make sure that the audio you want to encode is selected, as the Encoder will only work on the audio which is selected.

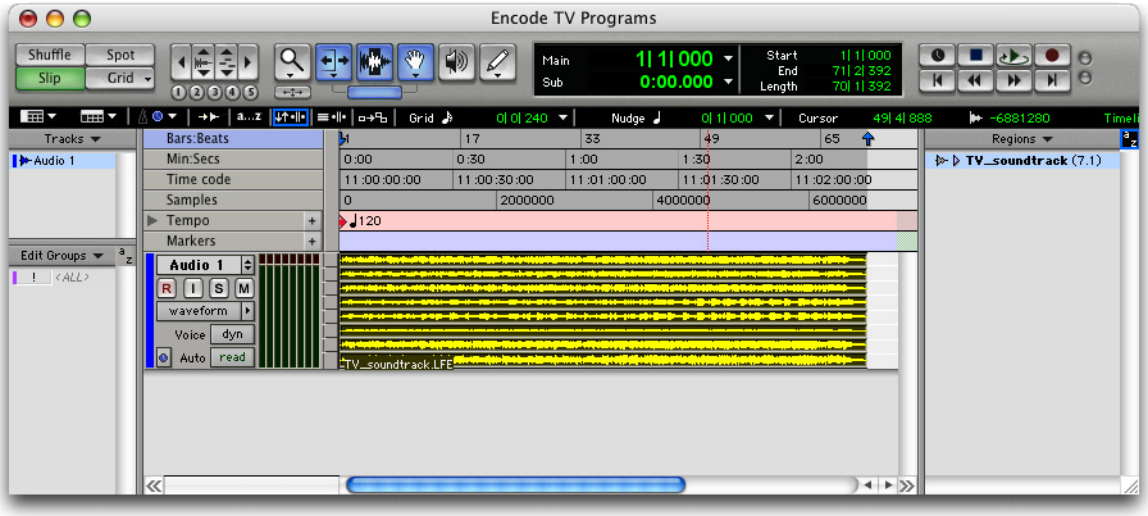

Figure 5-16

Next, select the SurCode for Dolby E Encoder from the AudioSuite menu (see Figure 5-17).

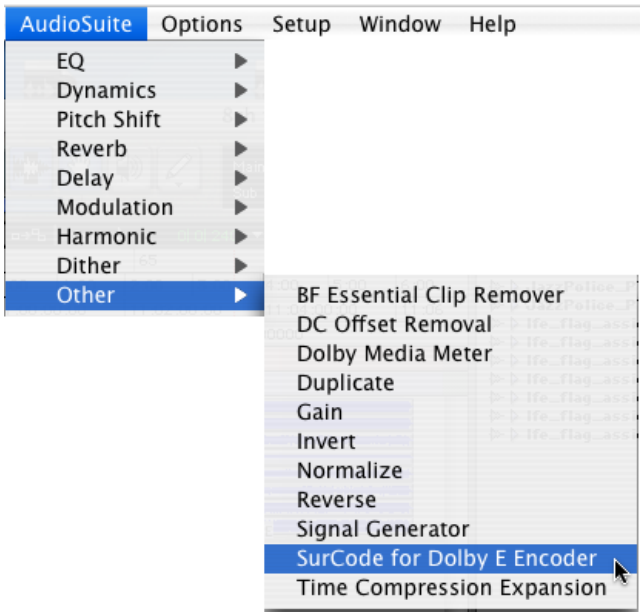

Figure 5-17

This brings up the Encoder plug-in (see Figure 5-18).

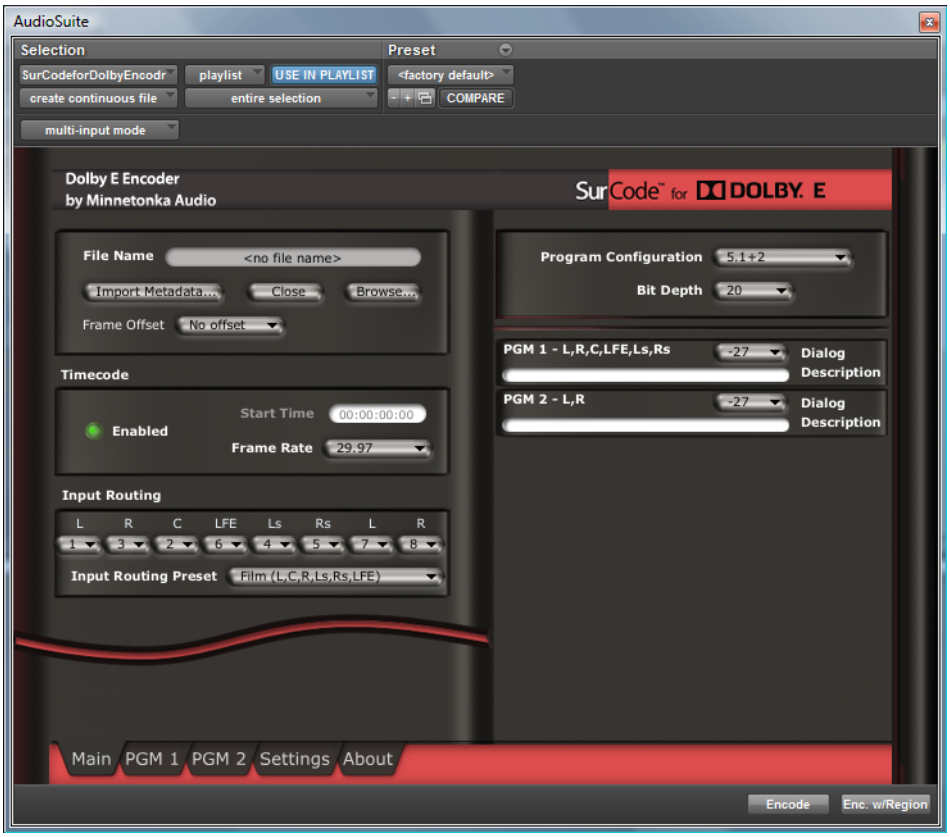

Figure 5-18

To create the encoded Dolby E file, select an output file name using the Browse button, set the desired metadata parameters and Input Routing, and click on the Encode button.

Note: In Pro Tools, there are 2 encode buttons, "Encode" and "Enc. w/Region". The "Encode" button is the one to use. The "Enc. w Region" button will encode, but will also create a new region which is a copy of the input audio.

5.1 Special Settings for Pro Tools

The settings tab has two special settings for Pro Tools (see Figure 5-19).

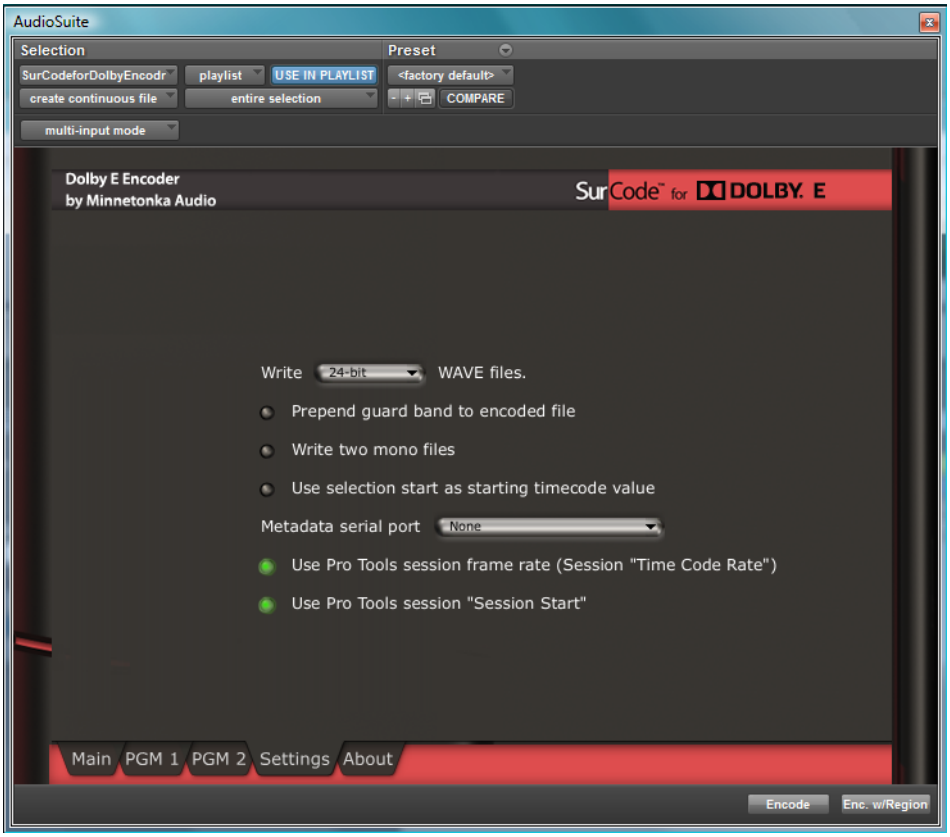

Figure 5-19

5.1.1 Use Pro Tools session frame rate

When this option is selected, SurCode will read the "Time Code Rate" in Pro Tools, and automatically set the frame rate in the encoder.

5.1.2 Use Pro Tools "Session Start"

When this option is selected, SurCode will copy the Pro Tools Session Start Time into SurCode's Start Time. This will be the starting time for the timecode embedded into the encoded file. If "Use

selection start as starting timecode value" is also selected, the starting timecode of the encoded file will be the selection start time offset by the Pro Tools Session Start Time.

6 Using the Encoder in Nuendo

Nuendo will need to be set up differently depending on whether your input soundfiles are multiple mono files or a single multichannel interleaved file. For both scenarios, it is necessary to have Nuendo set up to use multichannel outputs. If you are not already set up for multichannel outputs, go to Devices > VST Connections. This will bring up the window where you create busses, including the Output bus (see Figure 6-20).

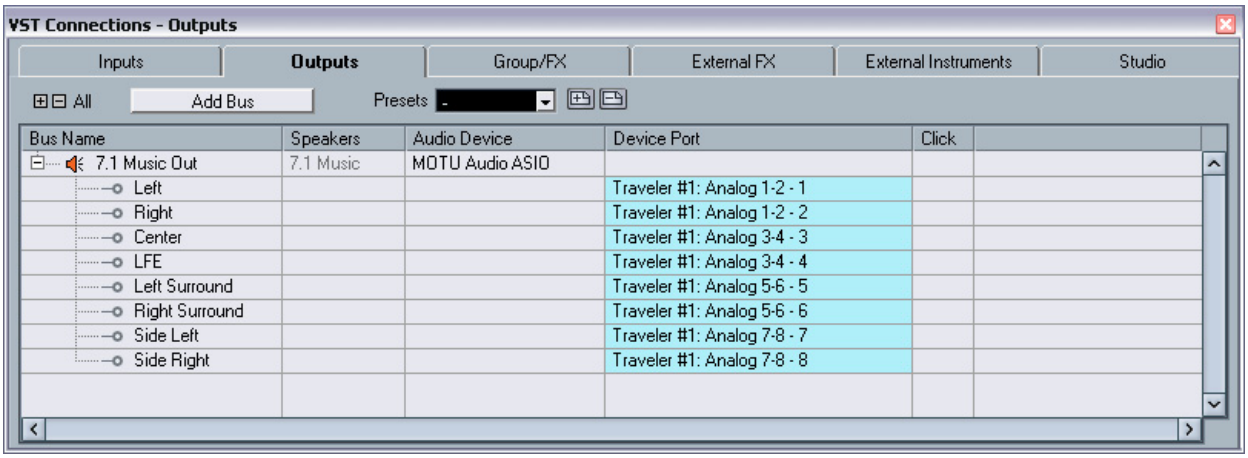

Figure 6-20

If you don't have a multichannel bus, first remove your stereo bus, and then click on Add Bus. Select a multichannel format (in the example, 7.1 Music was chosen).

Now you can create a project for encoding. If you are starting with an interleaved multichannel file, start by dropping a single multichannel track on the project. Do this by going to Project > Add Track > Audio. Then drag your soundfile onto the track (see Figure 6-21).

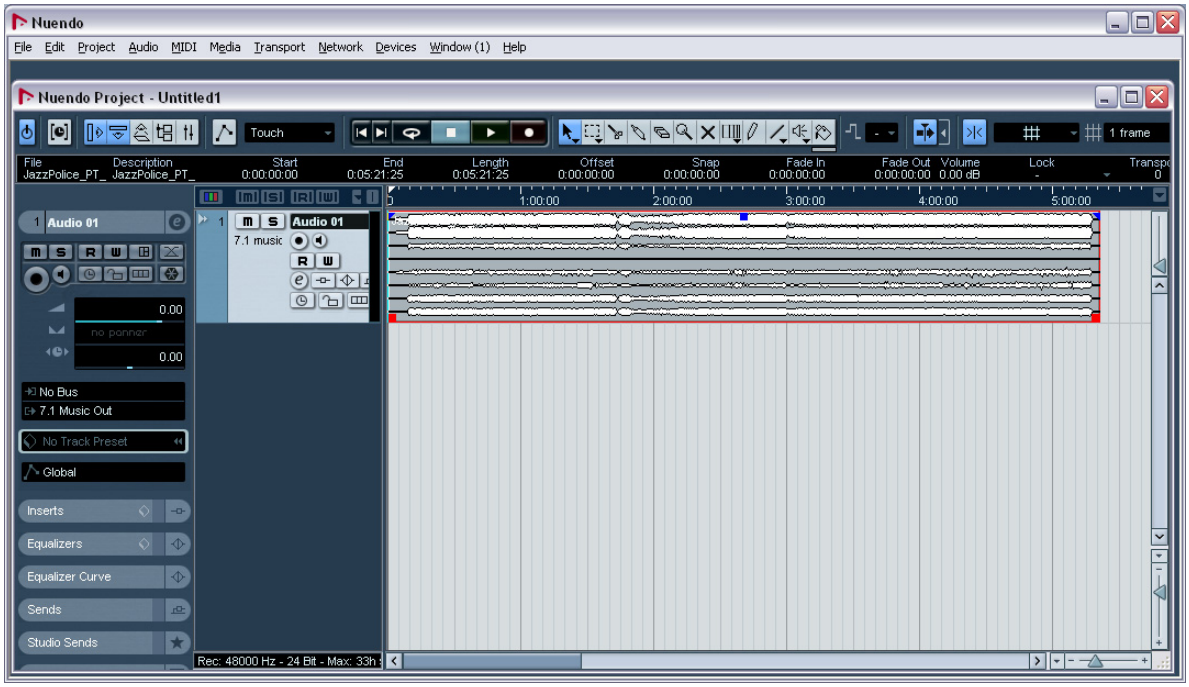

Figure 6-21

Drop the SurCode encoder onto the track by selecting it from the Inserts on the left (see Figure 6-22).

Figure 6-22

Select a filename for the encoded file by clicking on the Browse button on SurCode. After a file is selected, all you have to do is play the input soundfile in Nuendo, and SurCode will create the Dolby E encoded output file.

If you are starting with mono input files, you will need to create a project with one mono track for each channel (see Figure 6-23).

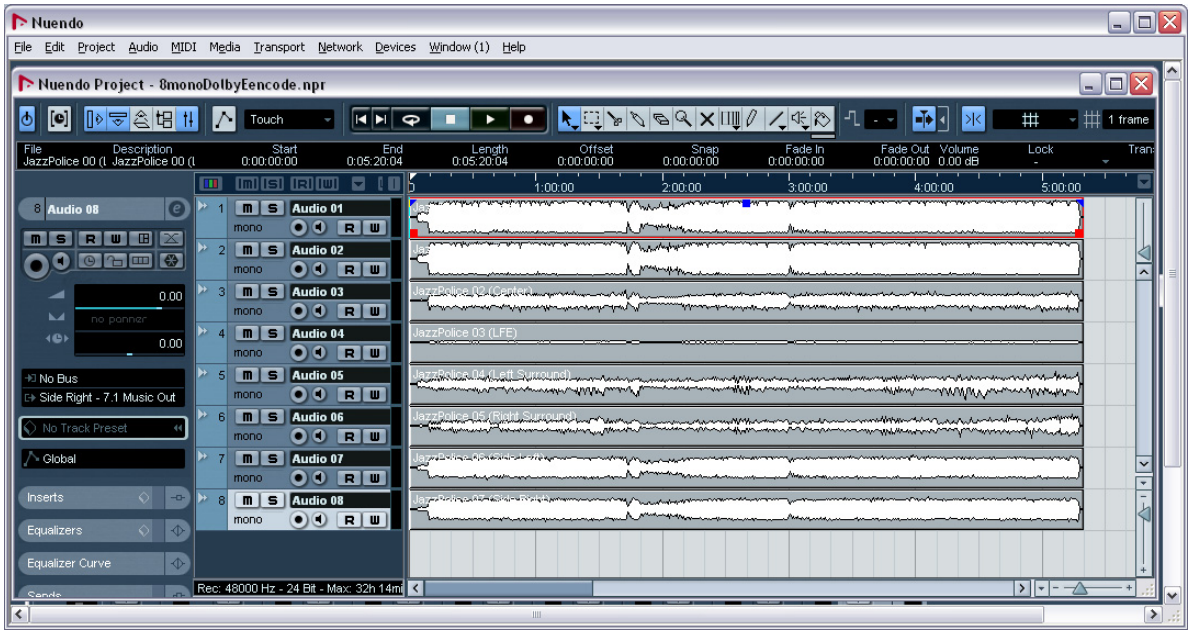

Figure 6-23

Then go to the Mixer window, and assign one mono sub-bus to the output of each track (see Figure 6-24).

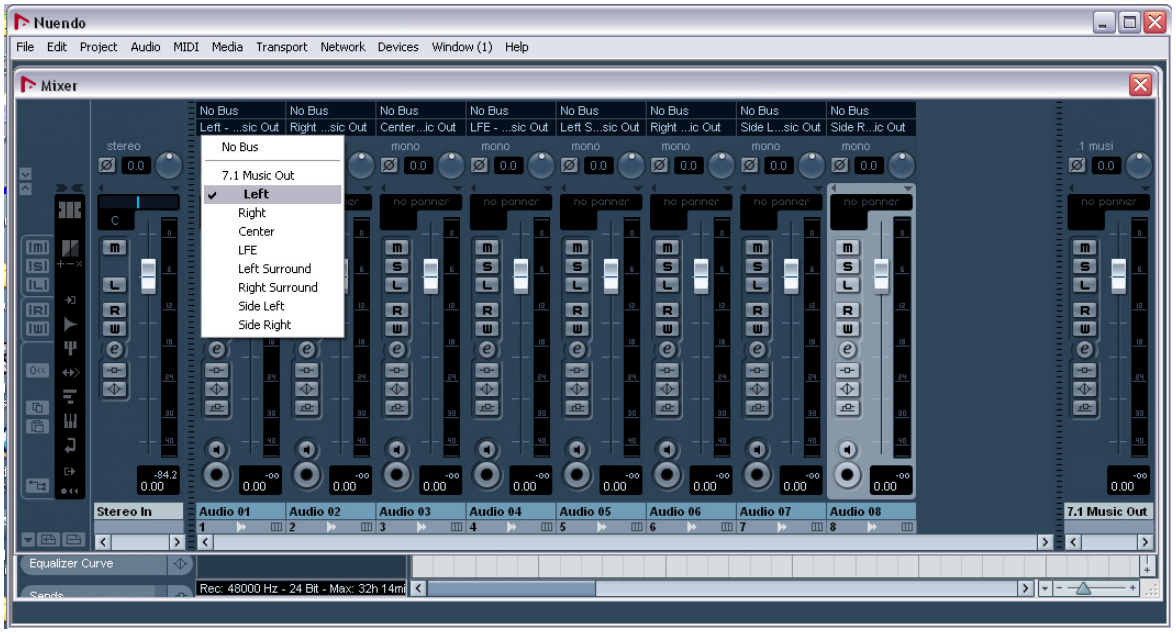

Figure 6-24

On this project, you will need to drop the encoder on the multichannel Master fader in order to pick up all of the mono inputs. Do this by clicking on the “e” button on the Master fader (the fader on the right side of the mixer) (see Figure 6-25).

Figure 6-25

This will bring up a new screen (see Figure 6-26). The Inserts column is on the left side.

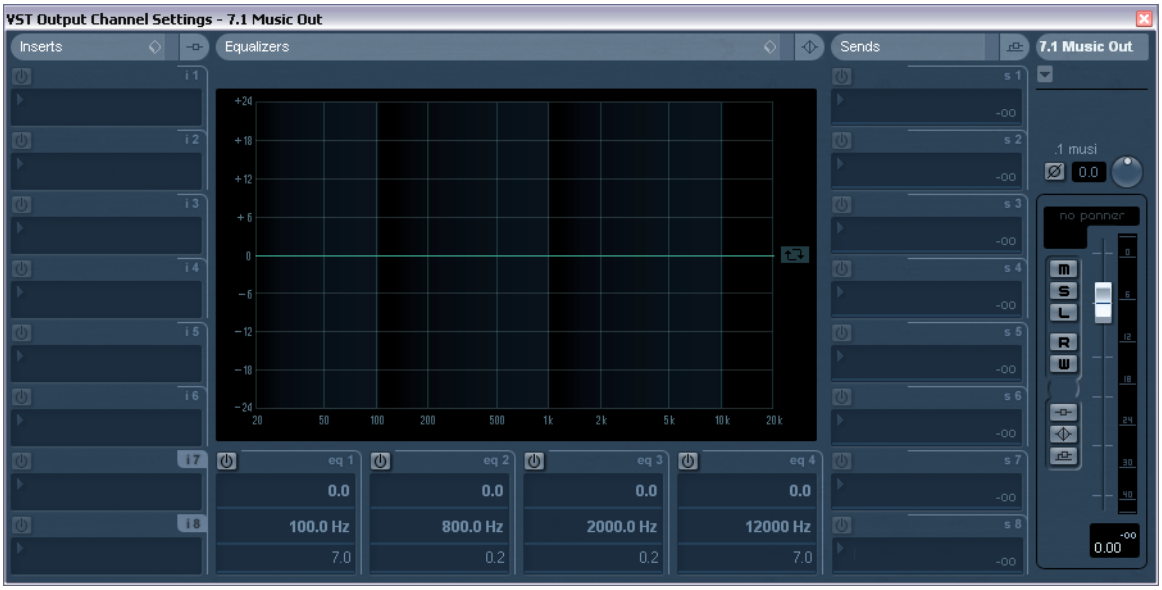

Figure 6-26

Click in the first box under “Inserts” and select the SurCode for Dolby E Encoder (see Figure 6-27).

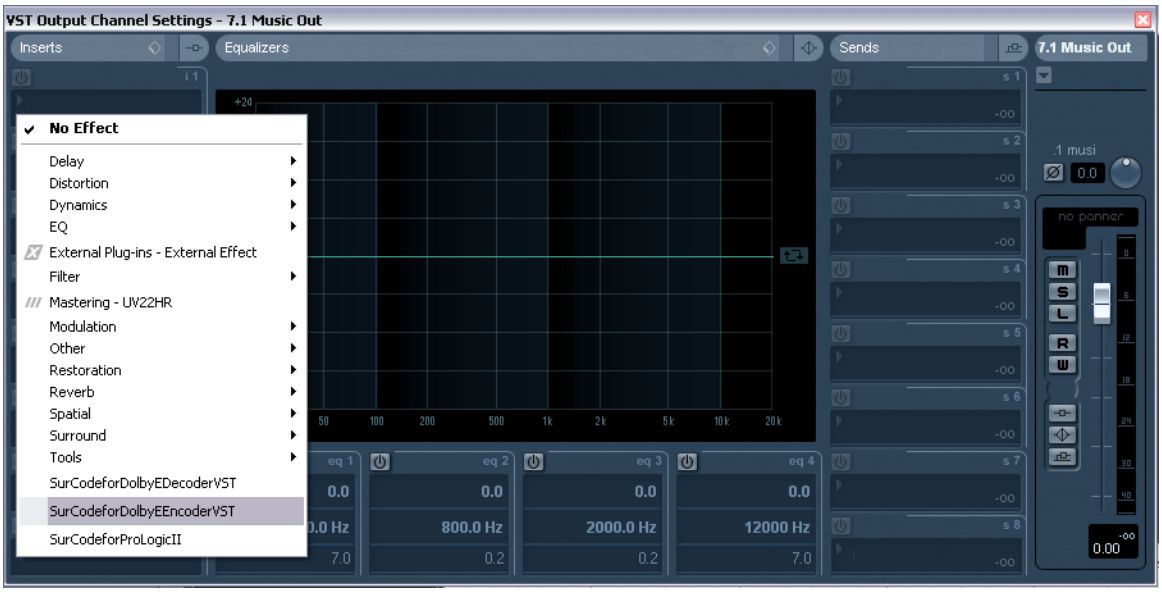

Figure 6-27

This will bring up the SurCode encoder window (see Figure 6-28).

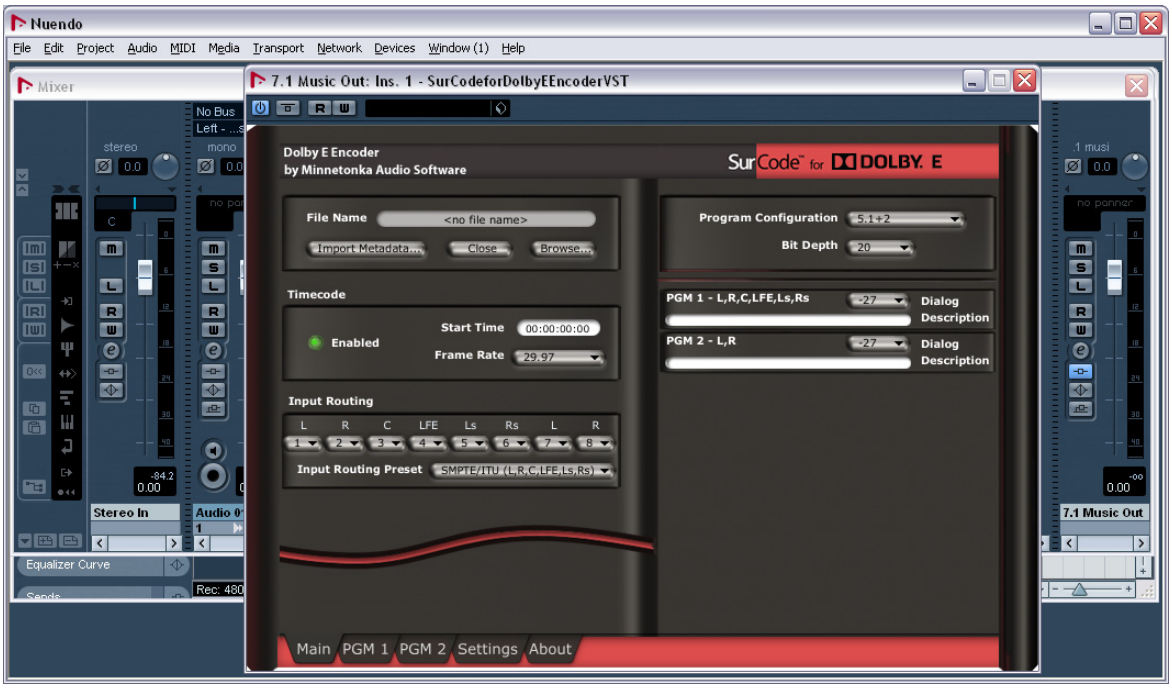

Figure 6-28

Nuendo is now ready to encode the 8 mono input files. Hit the Browse button on SurCode and select an output file name.

To perform the encode operation, simply play the input files on the timeline.

You can do a faster-than-real-time encode by using Nuendo's Audio Mixdown window (see Figure 6-29).

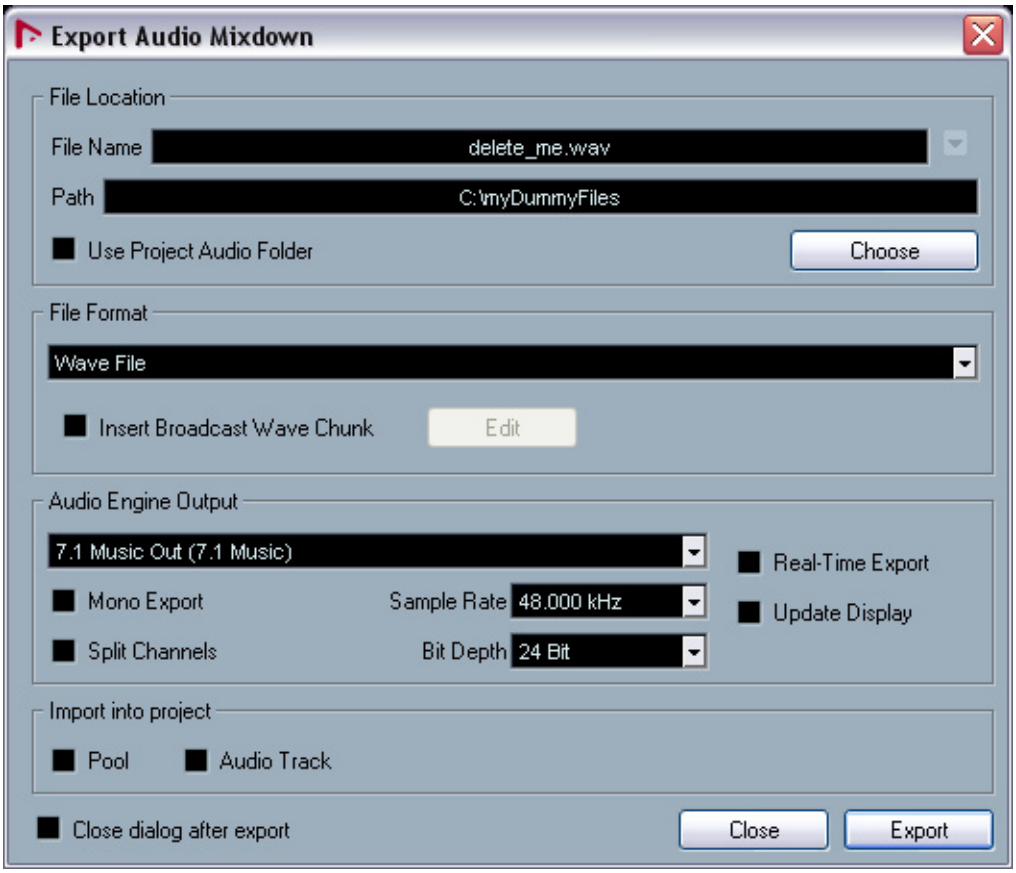

Figure 6-29

First, set the left- and right-locators on the track screen (see Figure 6-30), and then go to File > Export > Audio Mixdown.

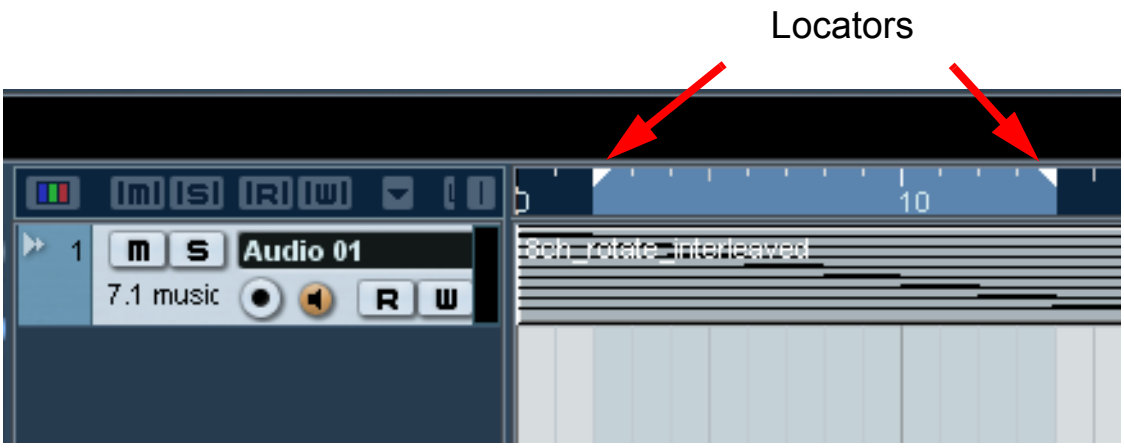

Figure 6-30

The mixdown will create an audio file that you will not want, so you can give it any filename, and delete it later. Then filename that you enter in the Mixdown dialog will be the name of this unwanted file and not the name of the encoded file. For faster-than-real-time encoding, leave the "Real-Time Export" checkbox unchecked.

The time location of the left locator is the time that is used for the Start Time, if the "Use selection start as starting timecode value" button is selected on the Settings tab.

7 Using the Encoder in Pyramix

The following is a step-by-step procedure to set up Pyramix for Dolby E encoding.

First, go to the Project menu and select New. This will bring up the New Project Wizard (see Figure 7-31).

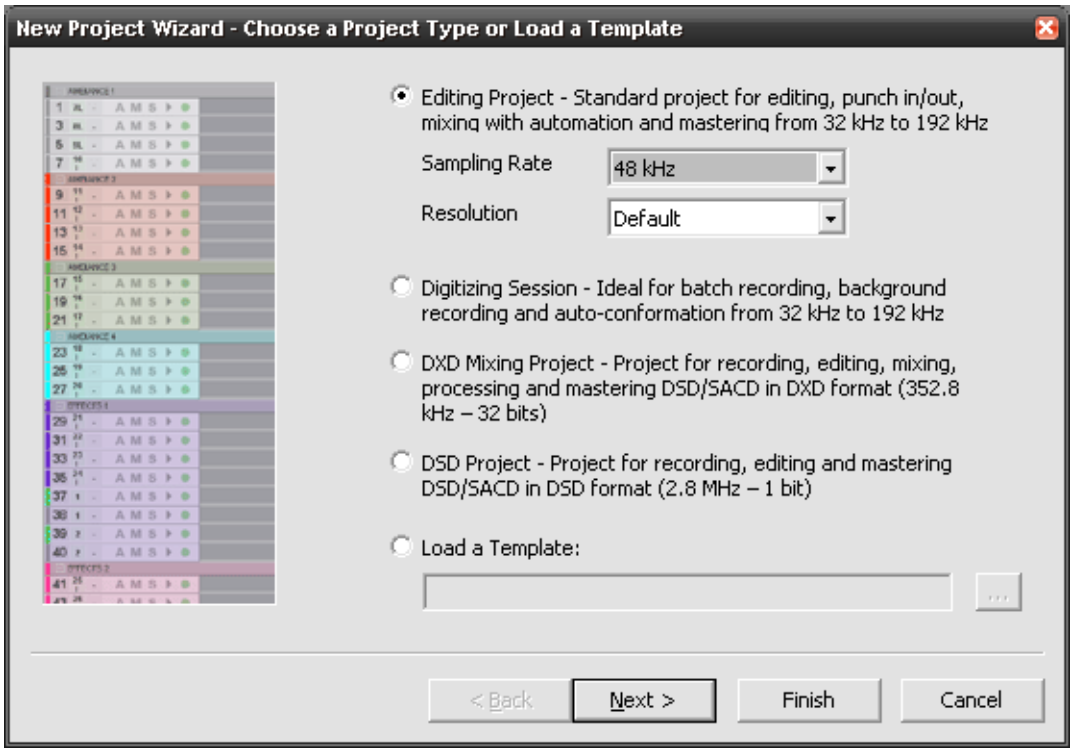
New Project Wizard - Choose a Project Type or Load a Template
Editing Project - Standard project for editing, punch in/out, mixing with automation and mastering from 32 kHz to 192 kHz
Sampling Rate
48 kHz
Resolution
Default
Digitizing Session - Ideal for batch recording, background recording and auto-conformation from 32 kHz to 192 kHz
DXD Mixing Project - Project for recording, editing, mixing, processing and mastering DSD/SACD in DXD format (352.8 kHz – 32 bits)
DSD Project - Project for recording, editing and mastering DSD/SACD in DSD format (2.8 MHz – 1 bit)
Load a Template:
< Back
Next >
Finish
Cancel

Figure 7-31

Accept the default setting by clicking on the Finish button.

Next, open the Configuration Wizard by right-clicking anywhere on the mixer surface, and select Settings > Wizard. Click the Next button to go to the second screen. Select Surround Mix and Stereo Mix, and click the Next button (see Figure 7-32).

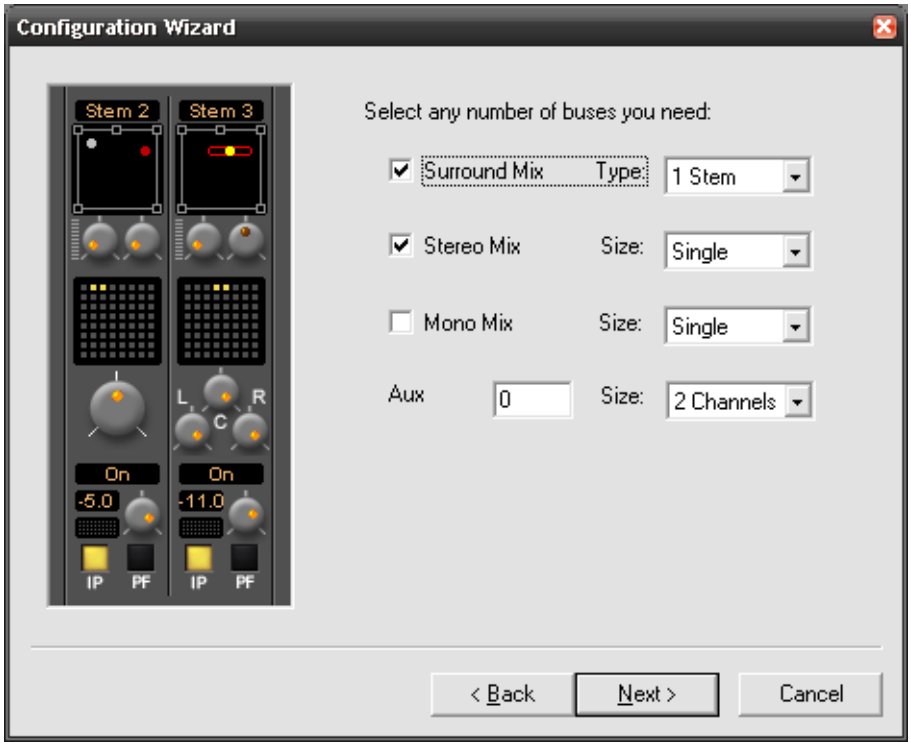

Figure 7-32

On the next page, request 1 GPS strip, and click the Next button (see Figure 7-33), and on the following page, click the Finish button.

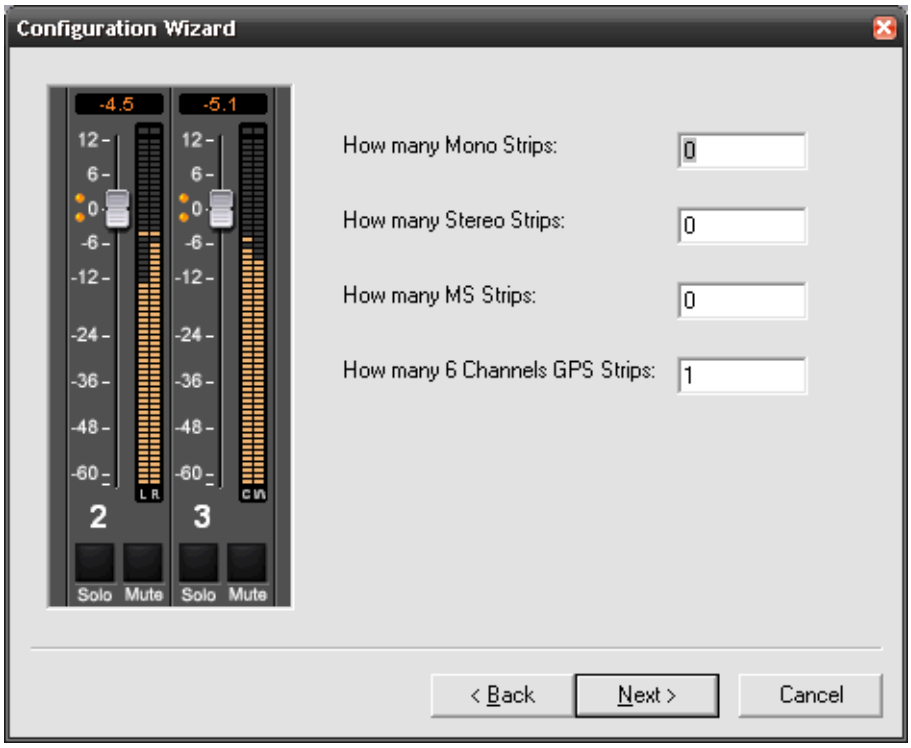

Figure 7-33

At the top right of the mixer are the letters “M A C R O”. Click on the “C” to go to the Configuration screen (see Figure 7-34).

Figure 7-34

This is the Configuration screen (see Figure 7-35). This is where you set up the mixer configuration. First, go to the bottom of the GPS strip (just above the Input Strips Summary). One of the boxes indicates the number of channels in the strip (in this case, “6 ch.”). Click on that button.

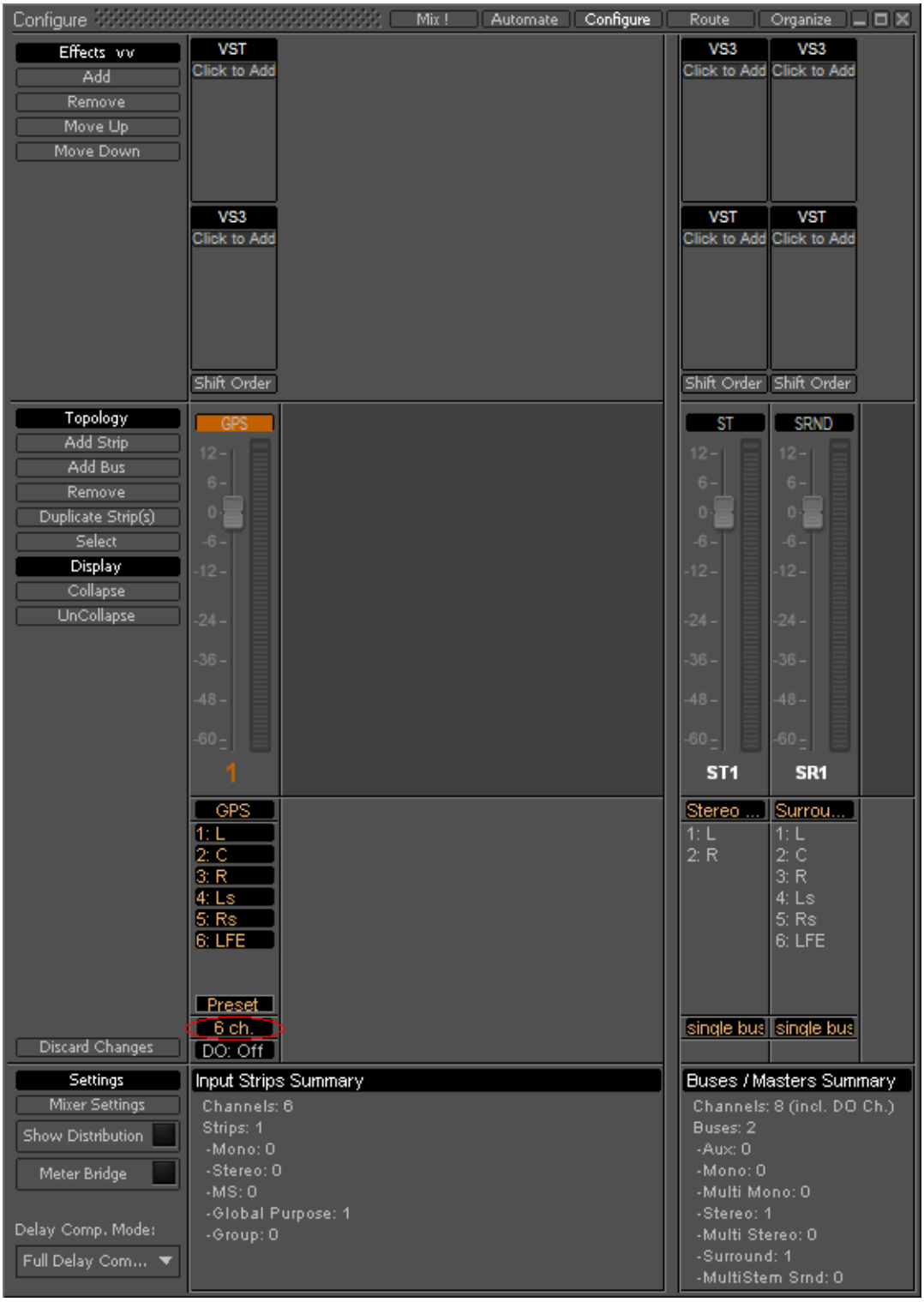

Figure 7-35

This brings up a window that allows you to select the number of channels in this strip (see Figure 7-36). Click on “8”.

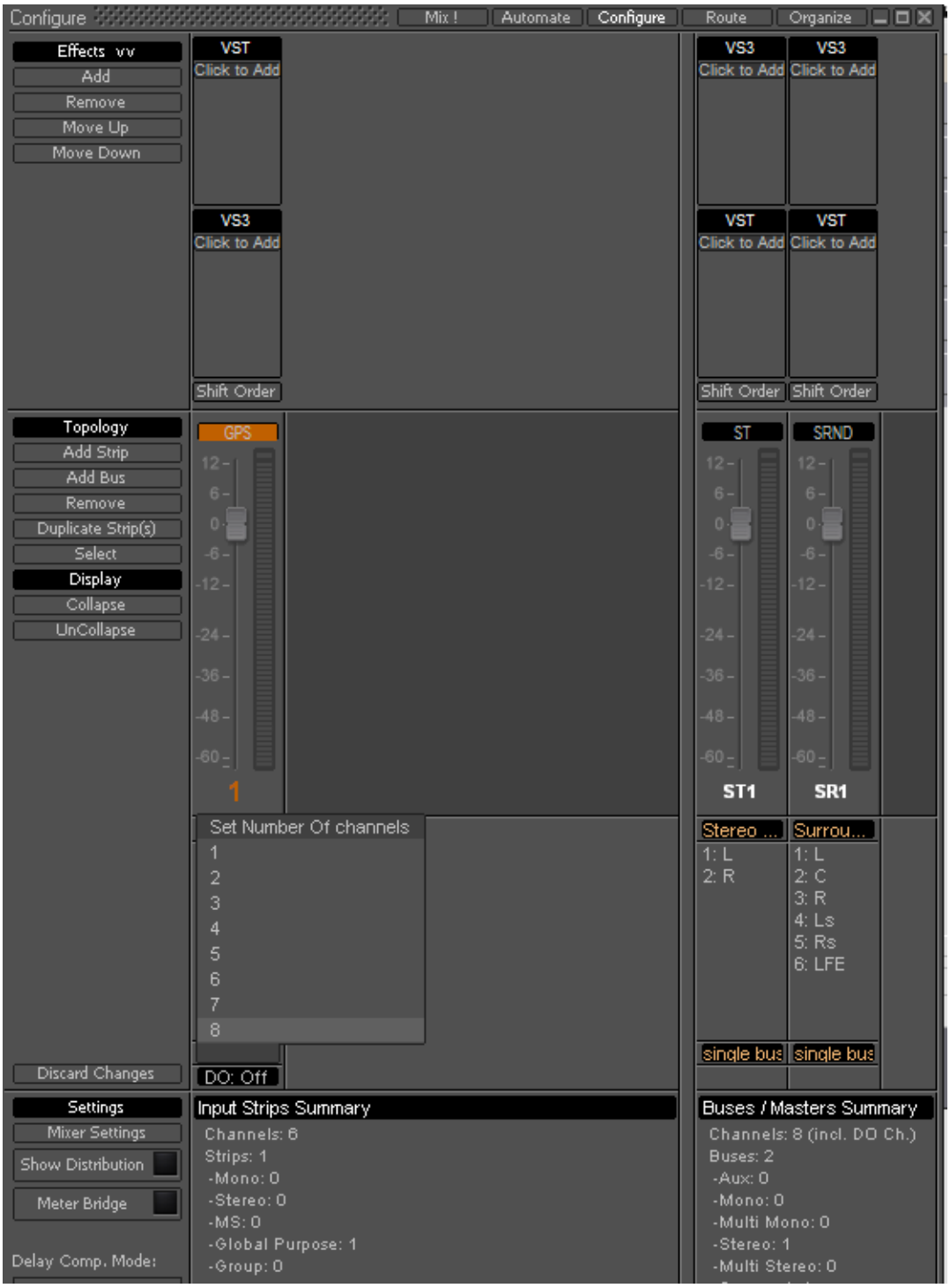

Figure 7-36

Next, you will need to assign speakers to each of these 8 mixer channels. To do that, click on the channels one at a time from the list (see Figure 7-37).

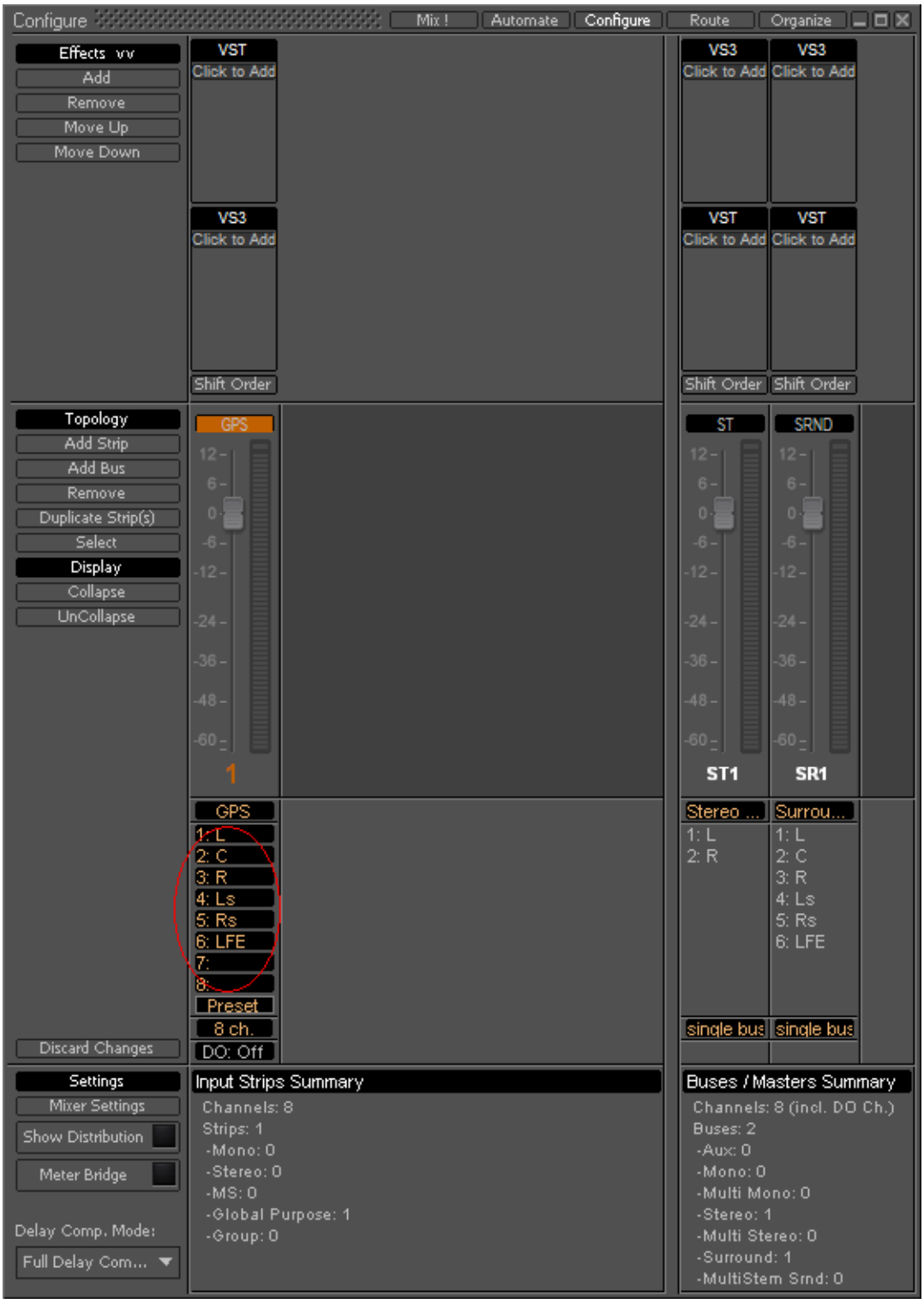

Figure 7-37

This will bring up a menu of the possible speaker selections. Click on the appropriate speaker for each of the 8 channels to assign them (see Figure 7-38).

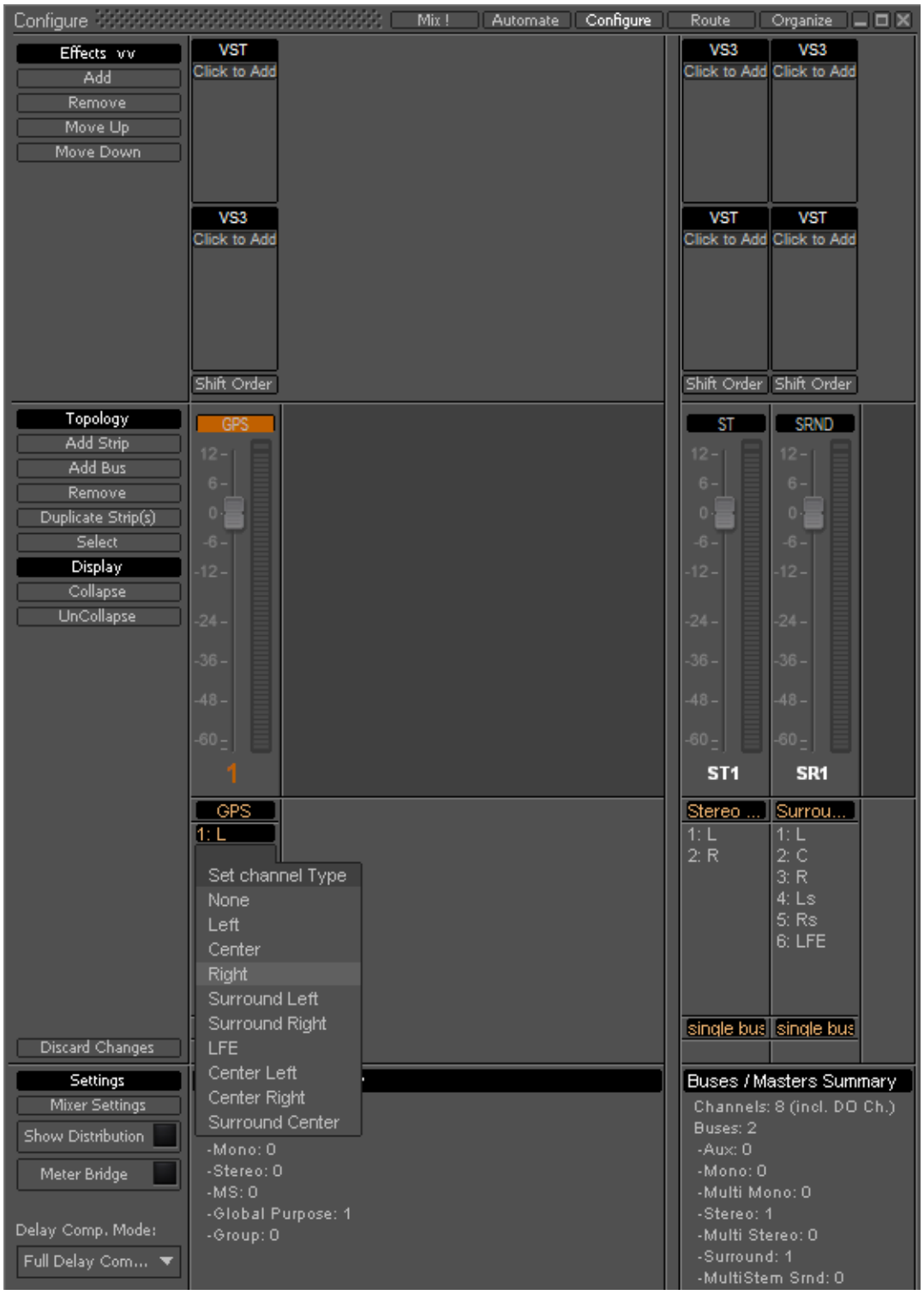

Figure 7-38

When you are done, the channel list should look like this (see Figure 7-39).

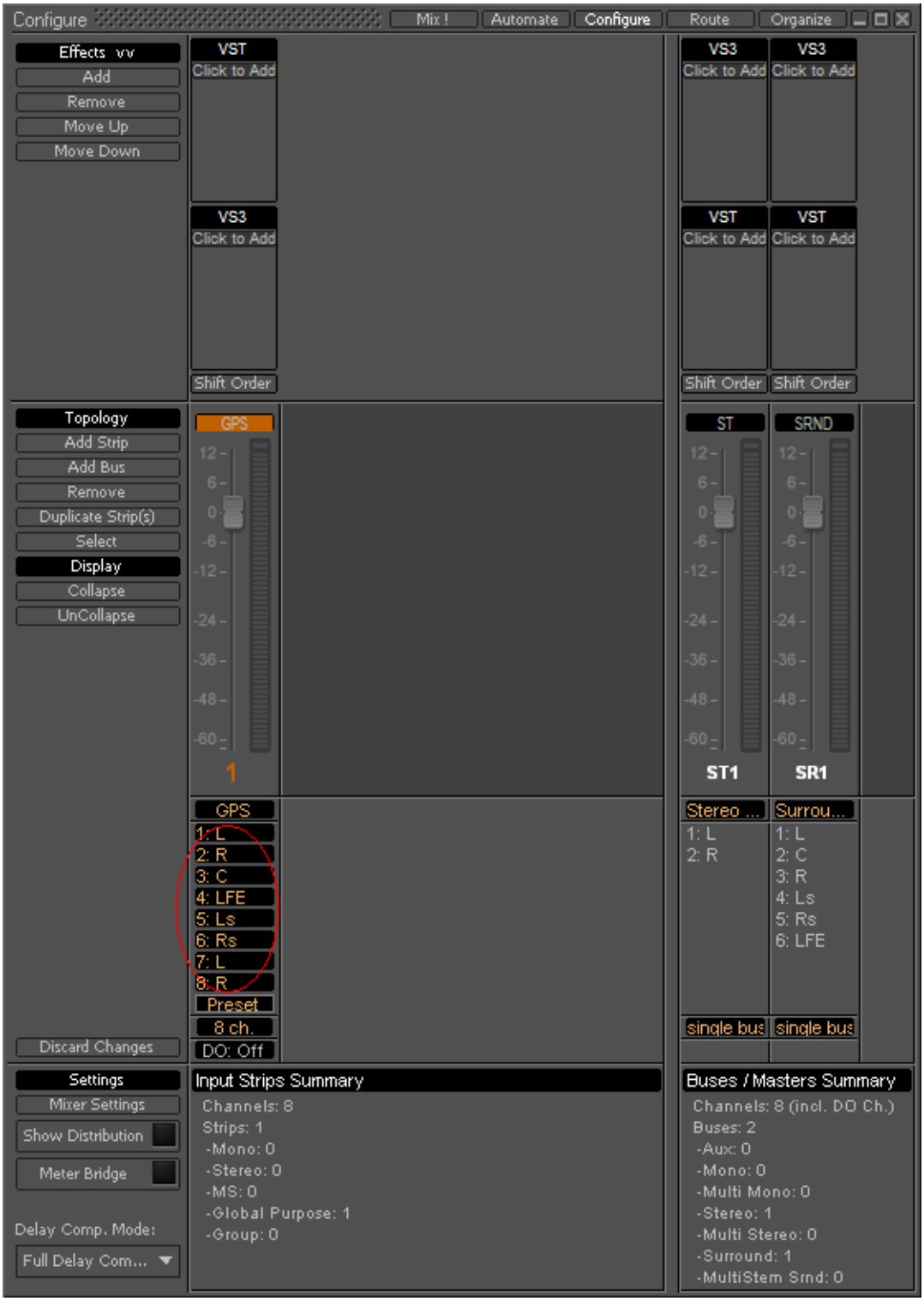

Figure 7-39

Open the SurCode for Dolby E Decoder plug-in by clicking on the “VST” button at the top of the mixer channel strip (see Figure 7-40). The plug-in will then be listed in the little window under the “VST” button.

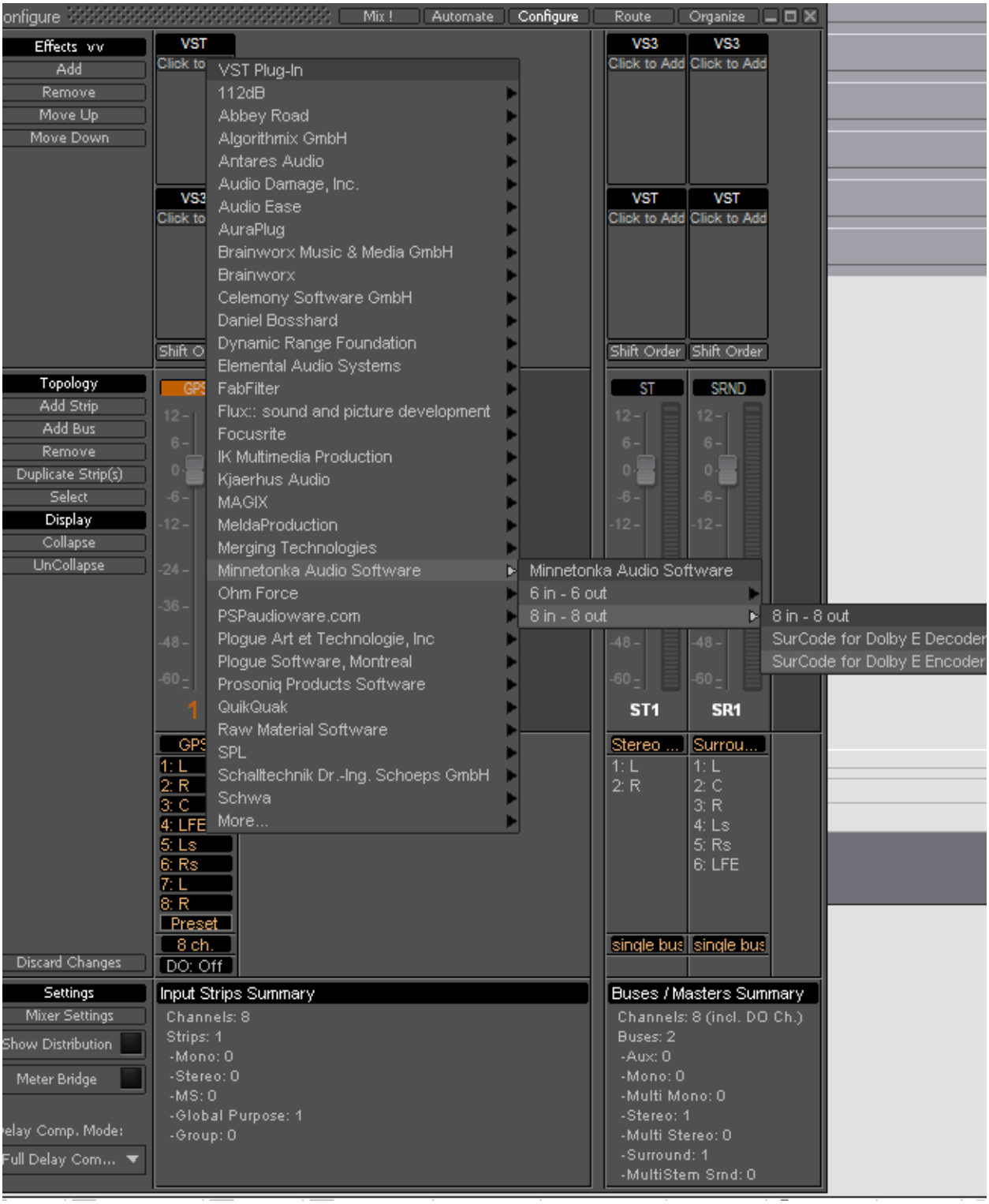

Figure 7-40

Switch from the Configure mode to the Mix mode. Open the Channel routing window by clicking on the small grid icon next to the knob on the Aux Bus send (see Figure 7-41).

Figure 7-41

Click the Auto button to clear the connections in the last 2 columns (see Figure 7-42).

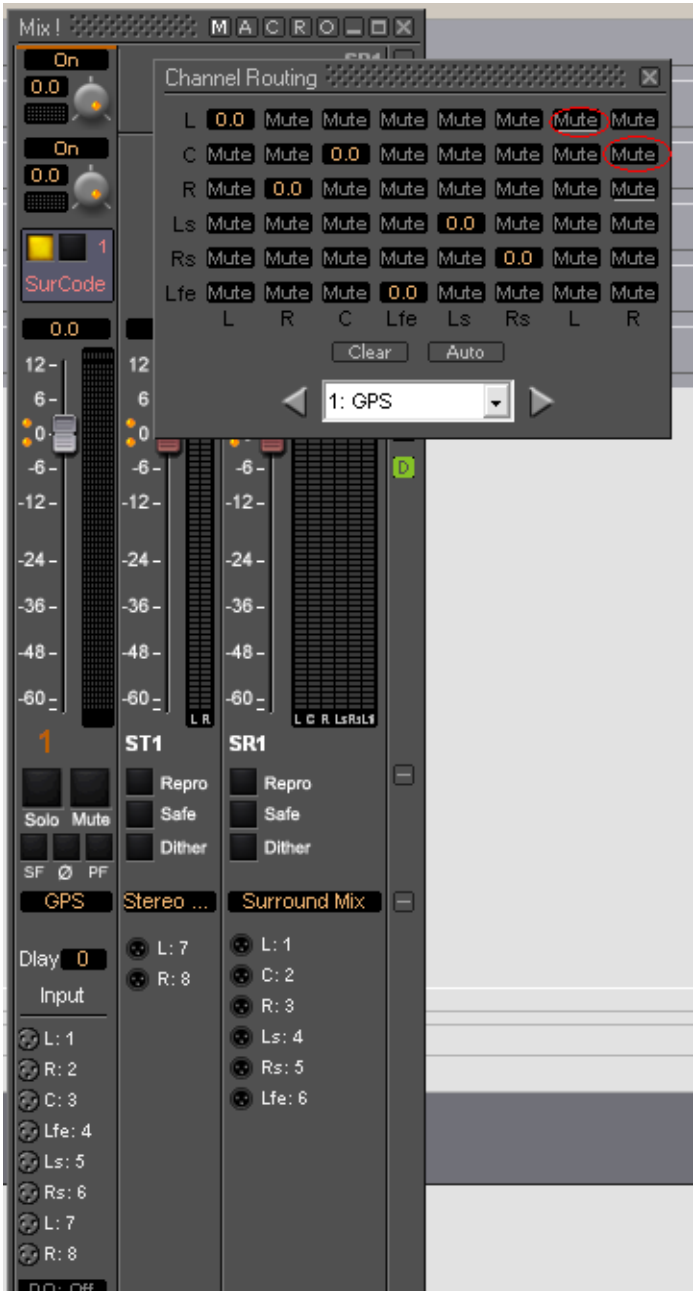

Figure 7-42

Go to the next Aux Send and click on the grid icon to bring up the Channel Routing for the stereo send. Click on the Auto button to set up the routing (see Figure 7-43).

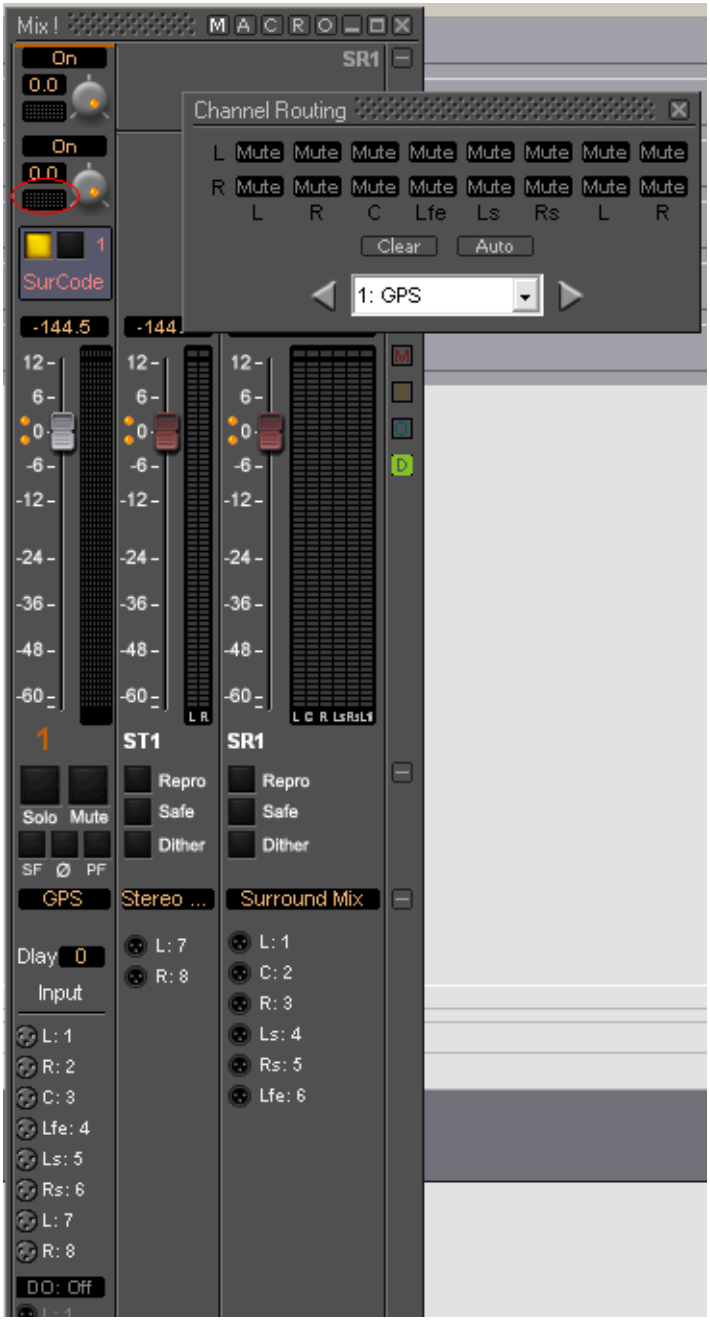

Figure 7-43

This will turn on the connections in the last two columns (see Figure 7-44).

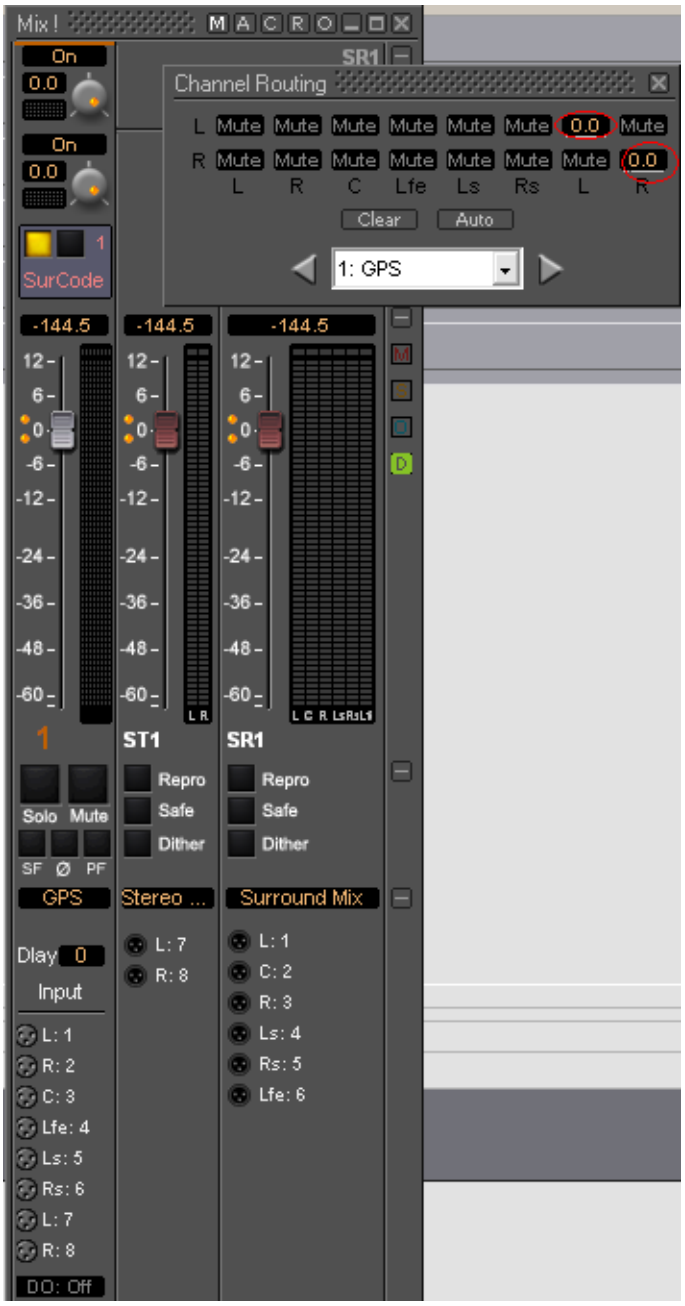

Figure 7-44

Go to the Track view and right-click on the first track. It will bring up a menu (see Figure 7-45). Click on Auto-Connect.

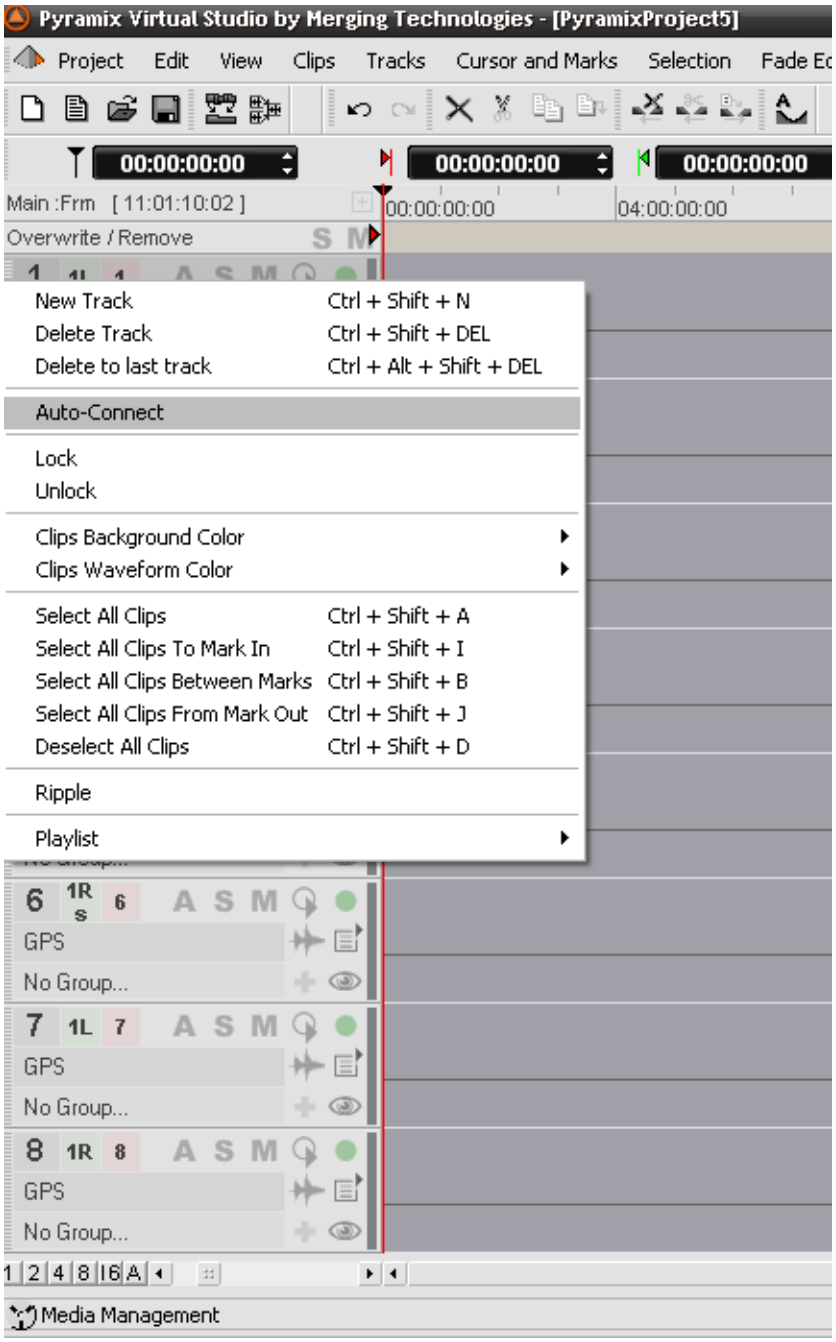

Figure 7-45

Now, you can bring up the SurCode user interface by clicking on the SurCode button on the Mixer. On SurCode, click on the Browse button to select an output filename for the encoded Dolby E file. (see Figure 7-46).

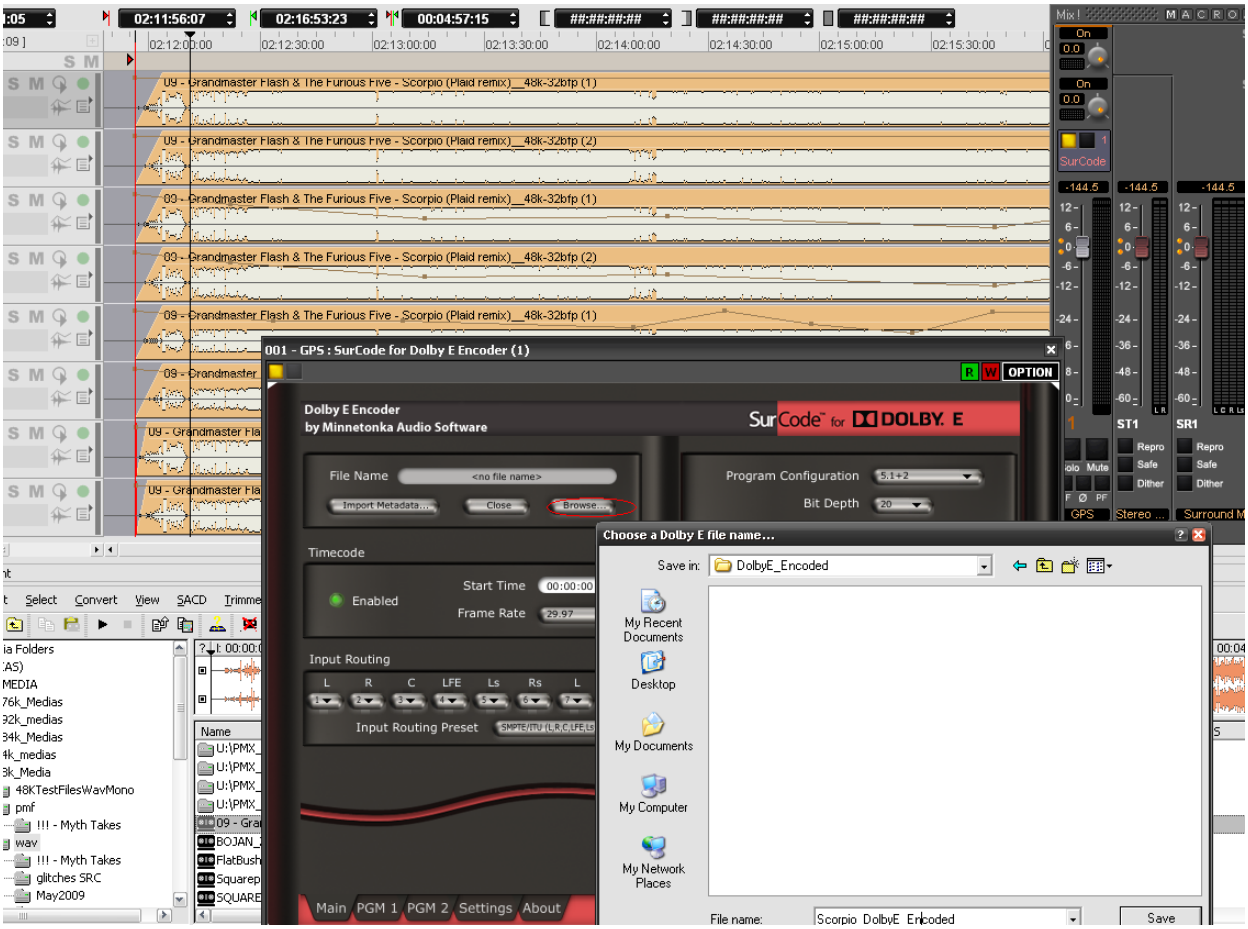

Figure 7-46

Make sure that SurCode is set to the same frame rate as the Pyramix project (see Figure 7-47).

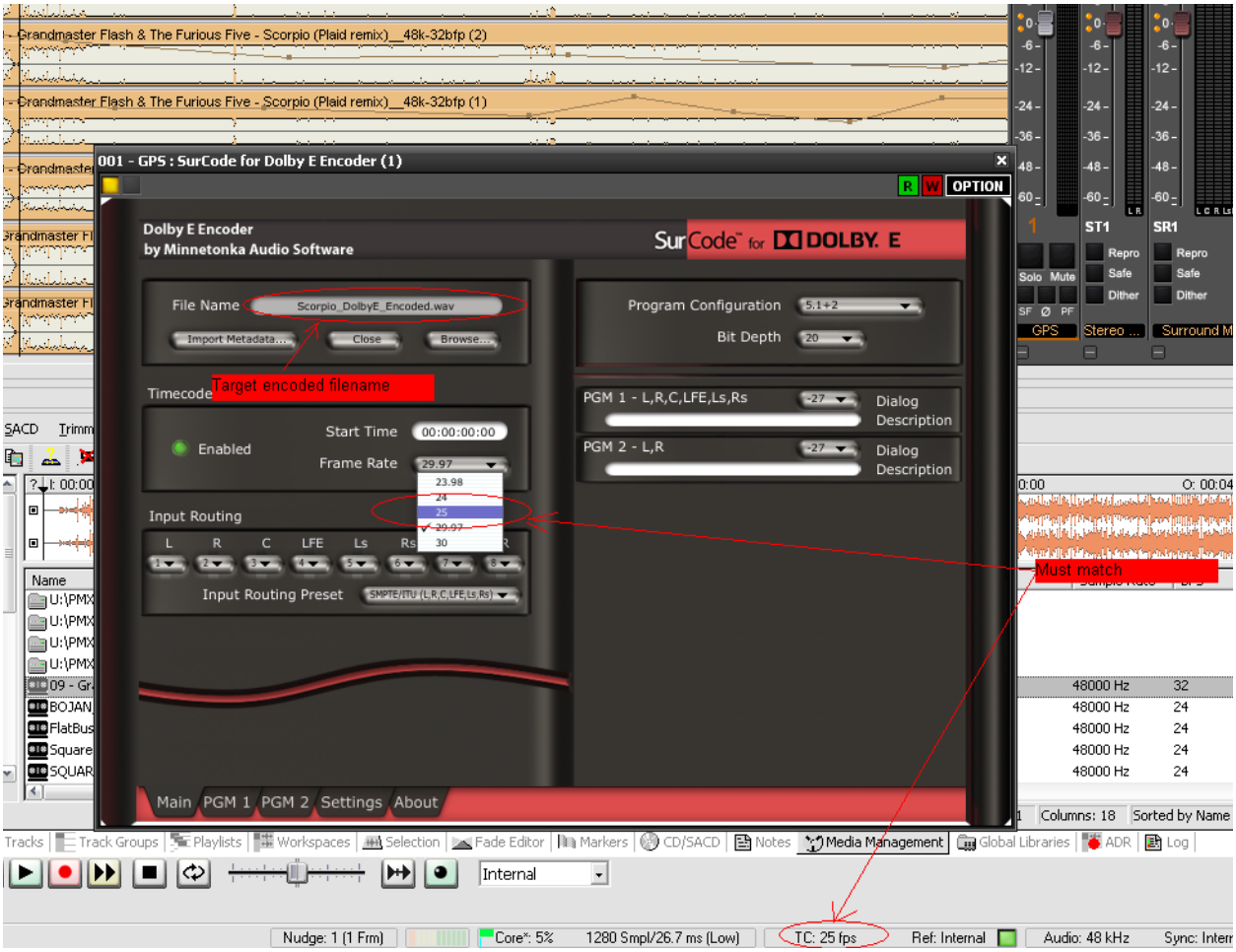

Figure 7-47

To perform the encode, go to the Project menu and select Mix Down (see Figure 7-48).

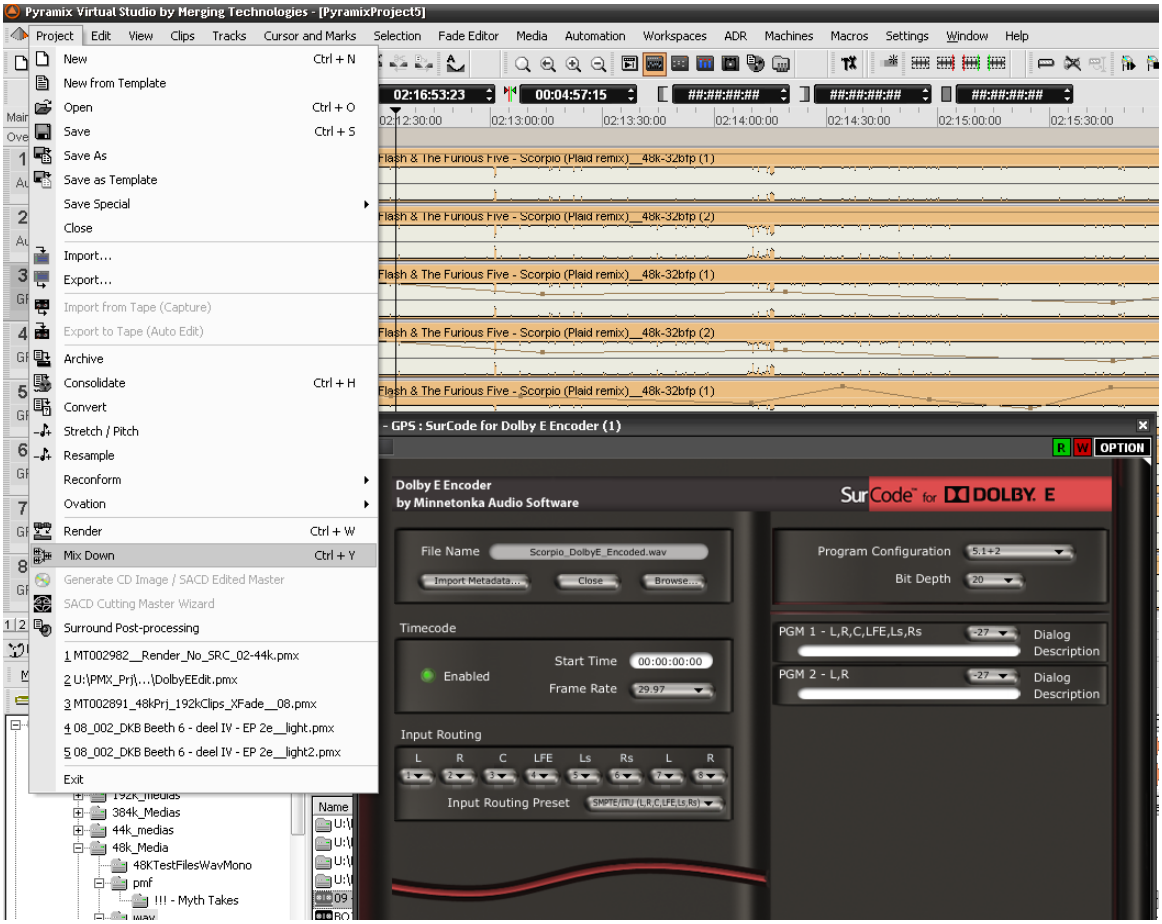

Figure 7-48

In the Mix Down window, you can choose whether the mix down is done in real time. If it is not in real time, it will encode faster (see Figure 7-49)

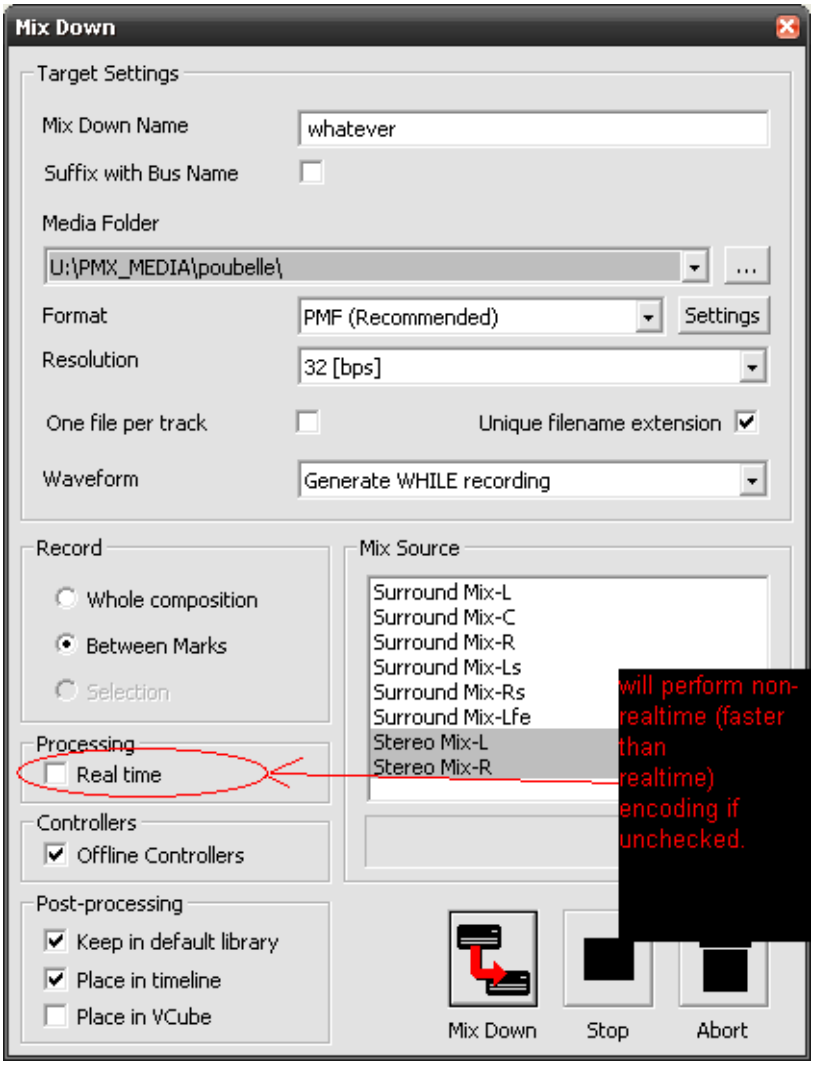

Figure 7-49

When the encoding has completed, click on the Close button in the encoder, to release the newly created Dolby E file (see Figure 7-50).

Figure 7-50

8 Appendix A Program Configurations

Table 1:

Program Configuration	Program Sequence	Configuration Name	Channels
0	5.1 + 2	5.1 + 2	Program 1: L,R,C,LFE,Ls,Rs Program 2: L,R
1	5.1 + 1 + 1	5.1 + 2x1	Program 1: L,R,C,LFE,Ls,Rs Program 2: C Program 3: C
2	4 + 4	4 + 4	Program 1: L,R,C,S Program 2: L,R,C,S
3	4 + 2 + 2	4 + 2x2	Program 1: L,R,C,S Program 2: L,R Program 3: L,R
4	4 + 2 + 1 + 1	4 + 2 + 2x1	Program 1: L,R,C,S Program 2: L,R Program 3: C Program 4: C
5	4 + 1 + 1 + 1 + 1	4 + 4x1	Program 1: L,R,C,S Program 2: C Program 3: C Program 4: C
6	2 + 2 + 2 + 2	4x2	Program 1: L,R Program 2: L,R Program 3: L,R Program 4: L,R
7	2 + 2 + 2 + 1 + 1	3x2 + 2x1	Program 1: L,R Program 2: L,R Program 3: L,R Program 4: C Program 5: C
8	2 + 2 + 1 + 1 + 1 + 1	2x2 + 4x1	Program 1: L,R Program 2: L,R Program 3: C Program 4: C Program 5: C Program 6: C

Table 1:

Program Configuration	Program Sequence	Configuration Name	Channels
9	2 + 1 + 1 + 1 + 1 + 1 + 1	2 + 6x1	Program 1: L,R Program 2: C Program 3: C Program 4: C Program 5: C Program 6: C Program 7: C
10	1 + 1 + 1 + 1 + 1 + 1 + 1 + 1	8x1	Program 1: C Program 2: C Program 3: C Program 4: C Program 5: C Program 6: C Program 7: C Program 8: C
11	5.1	5.1	Program 1: L,R,C,LFE,Ls,Rs
12	4 + 2	4 + 2	Program 1: L,R,C,S Program 2: L,R
13	4 + 1 + 1	4 + 2x1	Program 1: L,R,C,S Program 2: L,R Program 3: C
14	2 + 2 + 2	3x2	Program 1: L,R Program 2: L,R Program 3: L,R
15	2 + 2 + 1 + 1	2x2 + 2x1	Program 1: L,R Program 2: L,R Program 3: C Program 4: C
16	2 + 1 + 1 + 1 + 1	2 + 4x1	Program 1: L,R Program 2: C Program 3: C Program 4: C Program 5: C
17	1 + 1 + 1 + 1 + 1 + 1	6x1	Program 1: C Program 2: C Program 3: C Program 4: C Program 5: C Program 6: C
18	4	4	Program 1: L,R,C,S
19	2 + 2	2x2	Program 1: L,R Program 2: L,R

Table 1:

Program Configuration	Program Sequence	Configuration Name	Channels
20	2 + 1 + 1	2 + 2x1	Program 1: L,R Program 2: C Program 3: C
21	1 + 1 + 1 + 1	4x1	Program 1: C Program 2: C Program 3: C Program 4: C

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